CLAIMS

We Claim:

1. A method comprising:

providing a substrate; and

introducing oxygen to a carbon doped oxide precursor in the presence of said substrate for deposition of a carbon doped oxide film on said substrate.

2. The method of claim 1 wherein said carbon doped oxide precursor is selected from a group consisting of tetramethylcyclotetrasiloxane, a precursor having a formula of $H_x Si (CH_3)_{4-x}$, and a precursor having a formula of $(CH_3)_x Si (OCH_3)_{4-x}$.

3. The method of claim 1 wherein said oxygen is selected from a group consisting of ionic oxygen, molecularly stable oxygen, elementally stable oxygen, and ozone.

4. The method of claim 1 wherein said introducing comprises adding an inert background gas in the presence of said substrate to provide a volume filler for said deposition of said carbon doped oxide film.

5. The method of claim 1 wherein said introducing is via a chemical vapor deposition apparatus.

6. The method of claim 1 wherein said carbon doped oxide film has a dielectric constant of less than about 3.0.

7. The method of claim 1 wherein said deposition of said carbon doped oxide film occurs at a rate exceeding about 5,620 angstroms per minute.

8. The method of claim 1 further comprising etching said carbon doped oxide film for deposition of conductive lines, said carbon doped oxide film to act as an inter-layer dielectric between said conductive lines

9. A method of forming a carbon doped oxide film on a substrate, said method comprising:

placing said substrate on a susceptor of a chemical vapor deposition apparatus;

introducing a background gas, a carbon doped oxide precursor and oxygen into said apparatus; and

operating said apparatus at conditions to cause said carbon doped oxide film to form on said substrate.

10. The method of claim 9 wherein said carbon doped oxide precursor is selected from a group consisting of tetramethylcyclotetrasiloxane, a precursor having a formula of $H_x Si (CH_3)_{4-x}$, and a precursor having a formula of $(CH_3)_x Si (OCH_3)_{4-x}$.

11. The method of claim 9 wherein said conditions include a temperature of between about 250°C and about 450°C of said susceptor.

12. The method of claim 9 wherein said conditions include a pressure within said apparatus of between about 2 Torr and about 10 Torr.

13. The method of claim 9 wherein said background gas is inert helium.

14. The method of claim 9 wherein said introducing includes a flow rate of between about 50 Sccm and about 200 Sccm of said carbon doped oxide precursor, a flow rate of between about 20 Sccm and about 200 Sccm of said background gas, and a flow rate of between about 1.0 Sccm and about 20 Sccm of said oxygen.

15. The method of claim 9 wherein said chemical vapor deposition apparatus is a plasma enhanced chemical vapor deposition apparatus.

16. The method of claim 9 wherein said carbon doped oxide film is dimethyldimethoxysilane.

17. A carbon doped oxide film to be formed on a substrate from a carbon doped oxide precursor in the presence of oxygen.

18. The carbon doped oxide film of claim 17 to act as an inter-layer dielectric between conductive lines deposited on said substrate following etching of said carbon doped oxide film.

19. The carbon doped oxide film of claim 17 having a dielectric constant of less than about 3.0.

20. The carbon doped oxide film of claim 17 formed at a rate exceeding about 5,620 angstroms per minute on said substrate.